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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/622,881
Filing Date: July 18, 2003
Appellant(s): WARRIER ET AL.

George A. Coury
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 8/10/09 appealing from the Office action mailed 8/27/08.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

2003/0215689	Keegan	11-2003
6,139,810	Gottzmann et al.	10-2000

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1-3, 6, 7, 9-12 and 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Pre-Grant Publication No. 2003/0215689 hereinafter Keegan in view of U.S. Patent No. 6,139,810 hereinafter Gottzmann.

Keegan teaches a seal assembly for a solid oxide fuel cell stack (abstract), comprising at least two fuel cells each comprising an electrolyte 40 having a cathode layer 50, an anode layer 30, a bipolar plate 24 (see figure 1 and paragraph [0022]), and a seal 80 that is formed into a continuous closed loop structure that forms a substantially gas impermeable seal between opposed surfaces (see figures 3-5 and paragraph [0037]). Keegan further teaches that the seal is provided in a groove 82 which as defined by applicants is a compression stop (see figures 3-5) and that the seal comprises a stable oxide ceramic or other materials such as zirconia, alumina, and can be enhanced with materials such as nickel, silver, copper, iron and aluminum by doping (i.e. impregnating) (paragraphs [0037]-[0042]).

Keegan does not teach that the seal is a continuous fiber seal or the use of a frame.

Gottzmann teaches a solid oxide tube and shell reactor, wherein the solid oxide tubes are sealed with a continuous fiber tow wrapped into a closed loop structure (i.e. twisted rope seal) forming a substantially gas impermeable seal between the two components, wherein at least two fibers are in a substantially concentric relationship with each other, also comprising a compression stop extending from one of the reactor components to another reactor component that is frame like in shape as well as a

groove to hold the seal member, with dimensions similar to those found in claim 12 and that said seal can be compressed (figures 1-4, and column 7, line 8 – column 10, line 35).

Keegan and Gottzmann are analogous because they are from the same problem solving area of sealing high temperature reaction areas to prevent leakage of reactant gases.

At the time of the invention it would have been obvious to a person having ordinary skill in the art to include the teaching of the fiber sealing structure and frame member associated therewith in Keegan as taught by Gottzmann in order to provide a seal that is reinforced with a continuous fiber in the fuel cell stack and prevent any of the reactant gases from leaking out of the stack thus preventing any explosion hazards.

(10) Response to Argument

Appellants state that the seal of Keegan is not the same seal as recited in independent claims 1 and 24. This deficiency was provided to appellants in the grounds of rejection wherein it states "Keegan does not teach that the seal is a continuous fiber seal". This is why an obviousness rejection was made with Keegan in view of Gottzmann and not an anticipation rejection with just Keegan. Therefore because this is an obviousness rejection with two references; appellants' arguments arguing the references separately are not commensurate with the scope of the Grounds of Rejection. Appellants continue to argue that Gottzmann is supposedly non-analogous art. Both Keegan and Gottzmann teach high temperature solid oxide systems, both of which operate in the same temperature ranges, which therefore both must be

constructed with substantially similar materials that can withstand the harsh operating conditions, i.e. the materials can remain compliant when exposed to very high operating temperatures that is present in both systems. Keegan discloses the operating temperatures in ranges from 600-1000ºC (or greater), see paragraphs [0009], [0010], [0023], [0027] and [0034] and Gottzmann teaches discloses operating temperature in the range of 450-1200 ºC see column, 3, lines 5 et seq., column 8, lines 35 et seq. and column 9, lines 55 et seq., column 12, lines 10 et seq. In particular Gottzmann discloses in column 9, lines 55 et seq. that it is necessary for the seals to be maintained at temperatures in upwards of 650 ºC, such as a braided or twisted rope seal (column 9, lines 39-43). The difference between the two systems is the form factors of the cells within the systems. Keegan teaches plate shaped cells, like the ones present in the instant invention and Gottzmann teaches a shell and tube style reactor (i.e. cell). Regardless of the difference in form factors, the Examiner is not relying on the form factor of Gottzmann since Gottzmann is clearly used as a secondary reference, the Examiner is relying on the type of seal that Gottzmann uses to seal between components of the high temperature solid oxide system. Seals are a vital component to any fuel cell system regardless of its chemistry and operating temperatures. Without seals the volatile reactants that are fed to the system will leak out thereby causing a very hazardous situation that could result in the reactants igniting causing harm to anyone around the system and damage to its surroundings and even the potential of an explosion. Therefore when constructing a fuel cell such as the one disclosed by Keegan, which is substantially the same as the instant invention a skilled artisan would

be motivated to look to the prior art and look for seals that are used in high temperature operating environments and substitute a seal used in the same high temperature operating environment for the seal in Keegan. In the grounds of rejection the Teaching Suggestion Motivation (TSM) method was used to show why the above combination would have been obvious to a skilled artisan. It is also noted that the combination as provided in the grounds of rejection is a simple substitution of one known element for another to obtain a predictable result, which is to "provide a seal that is reinforced with a continuous fiber in the fuel cell stack and prevent any of the reactant gases from leaking out of the stack thus preventing any explosion hazards", see MPEP 2141 (III), Rationale B of the KSR v. Teleflex, Supreme Court decision (2007).

With regards to claim 24, appellants state that "the Examiner states that Gottzmann teaches a compression stop extending from one of the fuel cell components to another fuel cell component and that this compression stop is frame like in shape and has a groove to hold the seal member" (Appeal Brief page 11, second full paragraph). Said argument is not well take since the grounds of rejection clearly states "Gottzmann teaches"…" a compression stop extending from one of the reactor components to another reactor component that is frame like in shape as well as a groove to hold the seal member". There is nothing in the above Grounds of Rejection that even remotely states that Gottzmann teaches a "fuel cell" as appellants allege. Furthermore with regard to the "compression stop" in claim 24, Gottzmann was not relied on for said feature, since it is clearly stated in the grounds of rejection that Keegan teaches said feature and therefore since said feature is found in the primary reference no motivation

is necessary to modify the primary reference since no modification is necessary. With regards to claims 25 and 26 appellants only state that neither Keegan nor Gottzmann discloses a frame, with no further argument. As stated in the grounds of rejection above Gottzmann teaches the "frame" having a groove in the frame (i.e. compression stop in the frame). However it should be noted that the plates 25 of Keegan are in fact "frame" shaped and since the groove 82 for the seal 80 is provided in the frame shaped plate, Keegan actually discloses this feature already, which also appears to be substantially the same as the instant invention as seen in the instant drawings 6 & 7.

Therefore it is submitted that a skilled artisan would be motivated to provide a simple substitution of one known element (Gottzmann's continuous braided or twisted rope seal) for another (Keegan's seal) to obtain a predictable result, which is to "provide a seal that is reinforced with a continuous fiber in the fuel cell stack and prevent any of the reactant gases from leaking out of the stack thus preventing any explosion hazards".

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Robert Hodge/

Examiner, Art Unit 1795

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